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ABSTRACT

Contingent social reinforcement was applied differentially to aid the behavioral and educational development of a 9-year-old severely retarded nonverbal female with quadriplegic spastic cerebral palsy. Four behaviors prerequisite and collateral to beginning language development were defined and measured: eye contact, head control, initiative vocalization, and drooling. Non-professional staff who had contact with the child were trained in the differential application of contingent positive social reinforcement. Treatment was administered in multiple baseline design, and improvements in all behaviors were observed over the 20 week program and during a 1 month followup period. (Author/CL)

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Motor Habilitation and Beginning Language Training With A Severely Developmentally Disabled Child

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Running Head: Motor habilitation

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INTRODUCTION

In the education and treatment of the cerebral palsied (CP) child, Finnie (1970) cites head control as the basis for more complex movements. Pearson and Williams (1972) document the need to focus on head control as a prerequisite to further development in the quadriplegic spastic child. Bobath (1971) stresses the interrelationship of movement and language development, and the need to perfect physical activities for the CP child sequentially. Kolderie (1971) demonstrates the use of operant techniques to improve articulation, ambulation, strength and coordination in a CP child of average intelligence.

There have been several attempts to use electronic feedback apparatus to assist the development of physical behaviors. Azrin, Rubin, O'Brien, Allyon and Roll (1968) successfully used a postural control apparatus which provided a warning stimulus followed by an aversive tone to improve the slouching behavior of 25 "normal" adults. Leiper and Lang (Note 1) are currently developing an augmented sensory feedback therapy apparatus to assist CP children in the self monitoring of their head position. Although these approaches are appealing, electronic feedback apparatus may prove ineffective with the severely developmentally disabled child with multiple handicaps, too costly, insufficiently portable, or too technical to be monitored effectively by paraprofessional or non-professional staff who work with these children in many institutional settings.

With these factors in mind, it was postulated that positive social reinforcement applied differentially and contingently upon specific behaviors might prove to be an effective alternative. Although discrimination is less rapid than the combined use of positive reinforcement and punishment, there is evidence that punishment procedures are contraindicated in certain learning situations due to undesirable side effects of aggression (Azrin and Holz, 1966), withdrawal (Azrin,

Hake, Holz and Hutchinson, 1965) or fear generalization (Watson and Rayner, 1920). Social reinforcement applied differentially and contingently upon behavior has been found effective with the CP individual (Taylor and Persons, 1970) and reinforcement has been shown to facilitate imitation of model behavior (Baer, Peterson and Sherman, 1967). In addition, effective, low cost, short-term training in principles of behavior management for non-professional staff has been amply demonstrated (Bailey, Timbers and Phillips, 1971; Briscoe, Hoffman and Bailey, 1975; Johnson and Bailey, 1974; Johnson and Lobitz, 1974; Neidermeyer and Ellis, 1971; Surratt, Ulrich and Hawkins, 1969).

The purpose of this case study was to determine the effectiveness of contingent and differentially applied social reinforcement on four behaviors prerequisite and collateral to the motor habilitation and beginning language development of a severely retarded CP child. Increases in eye contact (EC), head control (HC) and imitative vocalization (IV) were hypothesized. Also hypothesized was a decrease in drooling behavior (D) as the incompatible behaviors of HC and IV strengthened.

SUBJECT

History

The S was a non-verbal nine year eight month old girl with hearing intact, but multiple developmental disabilities including a quadriplegic spastic form of CP, severe retardation, scoliosis, and frequent respiratory ailments. Institutionalized since infancy, she if totally dependent, spending much of her day in a crib, or wheelchair equipped with waist and shoulder straps. Prior to this study EC was minimal, HC poor, vocalizations rare, and she drooled continually. Due to such severe involvements, standardized test scores have been impossible.

Initial observation

The investigators observed and worked with the S for 10 weeks prior to this study. During this time they became familiar with the S's program and daily behaviors. Careful observation indicated that the child might be slumping her head

down to gain attention and affective response from staff members, visitors and volunteers. Formal measurement and intervention seemed appropriate.

Observation and recording

EC was defined as the S's looking at the investigator voluntarily or when prompted to do so. HC was defined as the S's maintenance of her head in an upright position voluntarily or upon request of the investigator. IV was defined as the S's imitating the sound requested by the investigator within a 3 second interval. D behavior was defined as the presence of saliva on the S's lips or down the corner of her mouth.

METHOD

Treatment

The S was seen 4 days per week each day in the same location at the same time for 20 weeks. One month after the last session a 5 day follow up was recorded by the investigators. Prior to data collection the S was placed in her wheel chair and strapped in as usual. Each session consisted of three 10 minute periods. Data on EC were collected for 10 minutes, HC for 10 minutes, and D for 10 minutes. Using a stopwatch, durations were recorded for EC and HC. Interval recording was used to determine a level of D behavior every 20 seconds. IV was requested and recorded for 60 trials as a + (compliance) or - (non-compliance) during the periods that duration of EC and HC were recorded. To control for order effects, data collection periods for EC, HC and D were randomly assigned daily. All data were converted into percentages.

Language Training

This study began implementation of a language training program for developmentally delayed children (Bricker, Dennison, Watson & Vincent-Smith, 1973). Because the S was severely involved physically, imitation of vowel sounds was selected as the first step in language development. Training began with the sounds for "a"

(as in "mama") and "oo" (as in "too"). Physical and gestural prompts were used to elicit and accompany imitation. As the subject mastered the sounds, prompts were faded. Prompts used to develop EC and NC were also faded as performance improved. Appropriate EC, NC and IV responses were immediately followed with the application of contingent social reinforcement. Three varieties of reinforcement were applied individually or in combination: verbal (i.e., "good girl"); non-verbal (i.e., smile and nod of head); physical (i.e., tickle or stroke on head or cheek). Inappropriate responses were not reinforced. After 20 weeks, the investigators instructed those staff members who regularly had contact with the S in the application of intermittent contingent social reinforcement for EC and NC behaviors only. However, the institution was unable to support a continuing formal language training program.

Design

A multiple base line design for EC, NC and IV was used. Prior to base line there was an initial adaptation period of one week. Treatment was initiated for EC, NC and IV following base line periods of 13, 29 and 38 days respectively. A 5 day reversal, and 7 day reinstatement of treatment followed. One month after the last session a 5 day follow up treatment was conducted by the investigators. It was felt this measure would represent response generalization with non-staff members. During treatment periods continuous reinforcement schedules were used and gradually thinned. The level of D behavior was recorded for the duration of the experiment. Although there was no direct intervention on this behavior, changes were recorded, during the base line and experimental phases involving manipulation of EC, NC and IV variables.

Reliability

Five samples of interobserver reliability were taken by 2 trained observers during the study to establish reliability of the operational definitions and measurement methods. Reliability was calculated (Wasik, Senn, Welch & Cooper, 1969) and ranged between 80 and 95%. The mean reliability was 90%.

RESULTS

The results are graphically presented in Figure 1.

Insert Figure 1 about here

The mean percentages for each behavior during each phase of the study are shown in Table 1.

Insert Table 1 about here

It can be seen that EC, HC and IV improved with the advent of treatment. Experimental control was demonstrated by mean decreases during reversals and increases during return to treatment periods. The follow up showed all behaviors to be at higher levels than during base line, however EC was the most highly retained. Without direct treatment, the mean levels of D behavior decreased as expected. This decreasing trend increased during reversal, and then decreased again during return to treatment and follow up.

DISCUSSION AND IMPLICATIONS

The data confirms the hypothesis that the treatment of contingent and differentially applied social reinforcement can improve the EC, HC and IV behaviors of a non-verbal, severely developmentally disabled child. Also confirmed was the hypothesis that direct and successful intervention for HC and IV would result in the indirect improvement of an incompatible behavior (evidenced by a decrease in D behavior). Although the follow up means were not impressively higher than baseline, several factors must be considered. Firstly, rapid progress with the

severely developmentally disabled may not be feasible. Secondly, the follow up data was collected by the investigators requiring that the child generalize to this new situation. Thirdly, given the largely custodial nature of programs for the retarded CP child, it is likely that there was little, if any, intentional application of differential contingent positive social reinforcement during the interval prior to follow up. In addition, it was beyond the scope of this study to investigate approaches to training non-professional staff. Fourthly, progress in discrimination was expected to be slow due to the use of contingent positive social reinforcement only.

The implications of this study for the treatment and education of the severely developmentally disabled child with multiple handicaps are three-fold:

1- Head control, thought to be the basis for more complex movements for the CP, (Pearson, et al., 1972; Finnie, 1970) may at least in certain cases be brought under operant control.

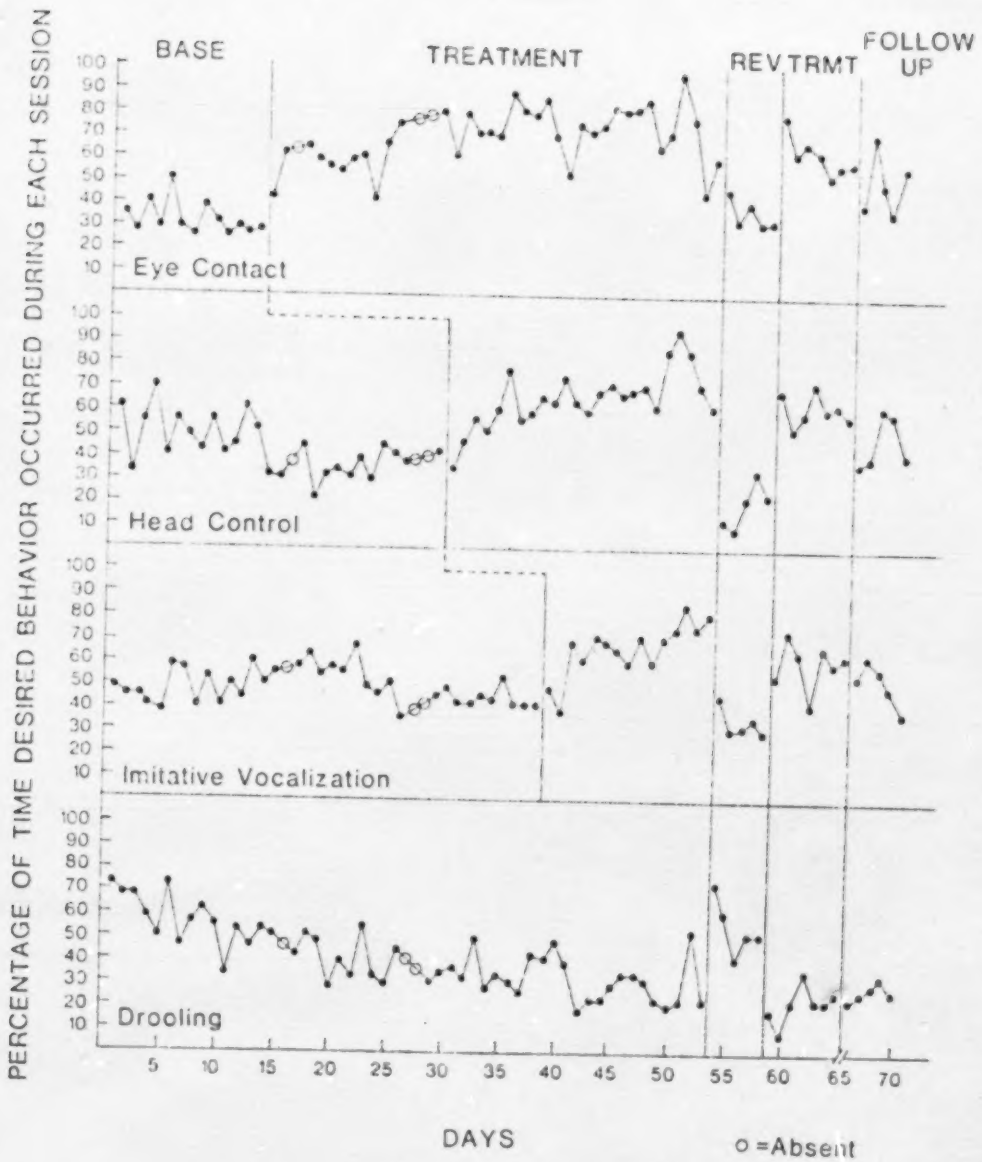
2- Although the development of language for the retarded CP is a time consuming procedure, sequential training (Bobath, 1971) in those prerequisite and collateral skills which are deficient (EC and RC) is possible and may be necessary.

3- A symptomatic behavior such as drooling which often precludes the desirability of staff involvement may not need to be treated directly, but can improve as a result of reinforcing incompatible behaviors.

These findings support a growing need to reevaluate programs for the developmentally disabled which are largely custodial, in view of the value of certain operant techniques (Baer, et al., 1967; Taylor, et al., 1970; Kolderie, 1971) in treatment and education. Further research on learning rate, retention and generalization is critically needed with the severely and multiple impaired. In addition, approaches to staff training, and program structuring should be evaluated.

FIGURE CAPTIONS

Figure 1. Daily percentages of EC, MC, TV and D behaviors during base line, treatment, reversal, return to treatment and follow up treatment phases.


BASE
TREATMENT
REV TRMT
FOLLOW UP
Eye Contact
Head Control
Imitative Vocalization
Drooling
PERCENTAGE OF TIME DESIRED BEHAVIOR OCCURRED DURING EACH SESSION
DAYS
o =Absent

REFERENCES

Azrin, N. H. Hake, D. F., Holz, W. C. & Hutchinson, R. R. Movitational aspects of escape from punishment. Journal of the Experimental Analysis of Behavior, 1965, 8, 31-44.

Azrin, N. H. & Holz, W. C. Punishment. In W. A. Honig (Ed.), Operant behavior: Areas of research and application. New York: Appleton-Century-Crofts, 1966.

Baer, D. M., Peterson, R. F. & Sherman, J. A. The development of imitation by reinforcing behavioral similarity to a model. Journal of the Experimental Analysis of Behavior, 1967, 10, 405.

Bailey, J. S., Timbers, C. D., Phillips, E. L. & Wolf, M. M. Modification of articulation errors of predelinquents by their peers. Journal of Applied Behavior Analysis, 1971, 4, 265-281.

Bobath, B. Motor development, its effect on general development and application to the treatment of cerebral palsy. Physiotherapy, 1971, 57, 1-7.

Bricker, D., Dennison, L., Watson, L. & Vincent-Smith, L. Language training program for young developmentally delayed children. Institute on Mental Retardation and Intellectual Development: Behavioral Science Monograph, 1973, 2.

Briscoe, R. V., Hoffman, D. B. & Bailey, J. S. Behavioral Community Psychology: Training a Community Board to Problem Solve. Journal of Applied Behavior Analysis, 1975, 8, 157-168.

Finnie, N. R. Handling the Young Cerebral Palsied Child at Home, New York, E. P. Dutton & Co., Inc., 1970.

Johnson, M. & Bailey, J. S. Cross age tutoring: fifth graders as arithmetic tutors for kindergarten children. Journal of Applied Behavior Analysis, 1974, 7, 223-232.

Johnson, S. M. & Lobitz, G. K. Parental manipulation of child behavior in home observations. Journal of Applied Behavior Analysis, 1974, 7, 23-31.

Kolderie, M. L. Behavior modification in the treatment of children with cerebral palsy. Physical Therapy, 1971, 51, 1083-1091.

Niedermeyer, F. C. & Ellis, P. A. Remedial reading instruction by trained pupil tutors. The Elementary School Journal, 1971, 71, 400-405.

Pearson, P. H. & Williams, C. Physical Therapy Services in the Developmental Disabilities, Springfield, Illinois, Charles C. Thomas, 1972.

Surratt, P. R. & Ulrich, R. E. & Hawkins, R. P. An elementary student as behavioral engineer. Journal of Applied Behavior Analysis, 1969, 2, 85-92.

Taylor, G. P. & Persons, R. W. Behavior modification techniques in a physical medicine and rehabilitation center. Journal of Psychology, 1970, 74, 117-124.

Wasik, B. H., Senn, K., Welch, R. H. & Cooper, B. R. Behavior modification with culturally deprived school children: two case studies. Journal of Applied Behavior Analysis, 1969, 2, 181-194.

REFERENCE NOTES

1. Leiper, C. & Lang, J. Augmented sensory feedback therapy for cerebral palsied children. The Rehabilitation Engineering Center of Moss Rehabilitation Hospital, Temple University, Drexel University (Progress report No. 4). Philadelphia, Pennsylvania: 1974-1975.

Table 1

Mean percentages for EC, HC, IV, and D during base line, treatment, reversal, return to treatment, and follow up treatment periods

Behavior	Base	Treatment	Reversal	Treatment	Follow up Treatment
EC	31.9	67.8	38.2	63.7	51.8
HC	43.7	66.1	20.6	62.6	43.6
IV	49.8	67.1	35.2	62.0	53.4
D	41.6	----	55.2	22.3	27.6